

Listing of Claims:

1. (Currently Amended) An optical device (100) for converting wavelength division multiplex (WDM) signals having pulses of which are simultaneous and carried by at different wavelengths ($\lambda_1, \lambda_2, \lambda_3, \lambda_4$) into an optical time division multiplexing/demultiplexing (OTDM) signal the having components of which are carried by at a the same wavelength (λ_4) and time shifted (t_1, t_2, t_3, t_4), which the device comprises comprising:

shifting means (102, 103, 104) adapted configured to introduce a time shift between the pulses of the WDM signals which are simultaneous and carried at the different wavelengths by the optical carriers[.];

modulation means (112, 113, 114) adapted configured to modify the optical power of the WDM signals[.];

an optical spectral and temporal multiplexer/demultiplexer (120)[.];

a birefringent propagation medium (130) into which the WDM signals having the pulses which are simultaneous and carried at the different wavelengths are injected ~~in such a manner as~~ to achieve [[a]] soliton trapping ~~phenomenon~~[.]; and

absorption means (140) adapted configured to introduce optical losses into the components of the OTDM signal.

2. (Currently Amended) An optical device for converting an optical time division multiplexing/demultiplexing (OTDM) signal whose having components which are time shifted (t_1, t_2, t_3, t_4) and carried by the at a same wavelength (λ_4) into wavelength division multiplex (WDM) signals whose having pulses which are simultaneous and carried by at different

wavelengths ($\lambda_1, \lambda_2, \lambda_3, \lambda_4$), which the device comprises comprising:

absorption means ~~(140) adapted~~ configured to introduce optical losses into the components of the OTDM signal[[,]];

a birefringent propagation medium ~~(130)~~ into which the OTDM signal having the components which are time shifted and carried at the same wavelength is injected ~~in such a manner as~~ to achieve [[a]] soliton trapping ~~phenomenon~~[[,]];

an optical spectral and temporal multiplexer/demultiplexer; ~~(120)~~[[,]] and modulation means ~~(112, 113, 114) adapted~~ configured to modify the optical power of the WDM signals having the pulses which are simultaneous and carried at the different wavelengths.

3. (Currently Amended) [[A]] The device according to claim 2, ~~characterized in that it~~ further ~~comprises comprising~~:

shifting means ~~(102, 103, 104) adapted~~ configured to introduce a time shift between the pulses of the WDM signals carried by ~~the~~ optical carriers.

4. (Currently Amended) [[A]] The device according to claim 1 ~~or 2, characterized in that~~ wherein the shifting means ~~(102, 103, 104)~~ comprise variable delay lines.

5. (Currently Amended) [[A]] The device according to claim 1 ~~or 2, characterized in~~ wherein the modulation means ~~(112, 113, 114)~~ comprise variable attenuators.

6. (Currently Amended) [[A]] The device according to claim 1 ~~or 2, characterized in that~~ it further ~~comprises comprising~~:

a polarization controller at ~~the~~ an entry of the birefringent propagation medium (130) to encourage ~~the~~ injection of WDM/OTDM signals into said propagation medium with a polarization at 45° to its main axes of the birefringent propagation medium.

7. (Currently Amended) [[A]] The device according to claim 1 ~~or 2, characterized in that~~ wherein the absorption means (140) comprise an electro-absorption modulator (MEA).

8. (Currently Amended) [[A]] The device according to claim 1 ~~or 2, characterized in that~~ wherein the absorption means (140) comprise a saturable absorber.

9. (Currently Amended) A method ~~of~~ for converting wavelength division multiplex (WDM) signals[[, the]] having pulses ~~of~~ which are simultaneous and carried ~~by~~ at different wavelengths ($\lambda_1, \lambda_2, \lambda_3, \lambda_4$)[[,]] into an optical time division multiplexing/demultiplexing (OTDM) signal[[,the]] having components ~~of~~ which are time shifted and carried ~~by the~~ at a same wavelength (λ_4), ~~by means of the device according to claim 1 or 2, which the method comprises~~ comprising the steps of:

time shifting the pulses of the WDM signals which are simultaneous and
carried at the different wavelengths by ~~the~~ optical carriers[[,]];

attenuating the WDM signals ~~in order for them to~~ such that the WDM
signals have different optical powers[[,]];

spectrally and temporally multiplexing the WDM signals having the
pulses which are simultaneous and carried at the different wavelengths[[,]];

injecting the ~~wavelength division multiplex obtained~~ WDM signals having

the pulses which are simultaneous and carried at the different wavelengths into
the a birefringent propagation medium in such a manner as to achieve [[a]] soliton
trapping phenomenon and obtain [[an]] the OTDM signal having the components
which are time shifted and carried at the same wavelength[.,,]; and

equalizing the optical power of ~~the~~ components of the obtained OTDM
signal having the components which are time shifted and carried at the same
wavelength obtained.

10. (Currently Amended) A method ~~of for~~ converting an optical time division
multiplexing/demultiplexing (OTDM) signal[[, the]] having components ~~of~~ which are time
shifted (t_1, t_2, t_3, t_4) and carried ~~by the~~ at a same wavelength (λ_4) into wavelength division
multiplex (WDM) signals[[, the]] having pulses ~~of~~ which are simultaneous and carried ~~by at~~
different wavelengths, ($\lambda_1, \lambda_2, \lambda_3, \lambda_4$), ~~by means of the device according to claim 2, which the~~
method ~~comprises~~ comprising the steps of:

attenuating the components of the OTDM signal ~~in such a manner that~~
~~they~~ the components have different optical powers[.,,];

injecting the OTDM signal into ~~the a~~ birefringent propagation medium ~~in~~
~~such a manner as to achieve [[a]] soliton trapping phenomenon and recover a~~
~~wavelength division multiplex~~ WMD signal having the pulses which are
simultaneous and carried at the different wavelengths[.,,];

spectrally and temporally demultiplexing the ~~wavelength division~~
~~multiplex~~ WMD signal in such a manner as to obtain a plurality of WDM signals
~~whose~~ having pulses which are time shifted and carried ~~by at the~~ different
wavelengths[.,,]; and

equalizing the optical power of the pulses of each of said recovered plural
~~the~~ WDM signals which are timed shifted and carried at the different wavelengths
~~obtained.~~

11. (Currently Amended) ~~[[A]]~~ The method according to claim 10, ~~characterized in that it~~
further ~~consists in~~ comprising:

time shifting the pulses of ~~the~~ each of said plural WDM signals carried by
~~the~~ resulting optical carriers ~~in such a manner as~~ to render them simultaneous.

12. (New) The device according to claim 2, wherein the shifting means comprise variable
delay lines.

13. (New) The device according to claim 2, wherein the modulation means comprise
variable attenuators.

14. (New) The device according to claim 2, further comprising:

a polarization controller at an entry of the birefringent propagation
medium to encourage injection of WDM/OTDM signals into said propagation
medium with a polarization at 45° to main axes of the birefringent propagation
medium.

15. (New) The device according to claim 2, wherein the absorption means comprise an
electro-absorption modulator.

16. (New) The device according to claim 2, wherein the absorption means comprise a saturable absorber.